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IS : 9316 (Part 6) - 1988

(Reaffirmed 2000)

Indian Standard

METHODS OF TEST FOR RUBBER LATEX

PART 6 DETERMINATION OF *p*H

RL : 6

(First Revision)

UDC 678·4·031 : 543·257·1

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Gr 2 *September* 1988

Indian Standard

METHODS OF TEST FOR RUBBER LATEX

PART 6 DETERMINATION OF *p*H

RL : 6

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part 6) (First Revision) was adopted by the Bureau of Indian Standards on 14 March 1988, after the draft finalized by the Rubber Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 Test methods for rubber latex had been originally covered in the following Indian Standards:

a) For natural rubber latex
  IS : 3708 (Part 1)-1966*
  IS : 3708 (Part 2)-1968†
b) For styrene butadiene rubber latex
  IS : 4511 (Part 1)-1967‡

0.2.1 Since some of the test methods covered in above standards were common, the concerned Committee had decided some years ago to unify and publish a separate series of methods of test which would be applicable to all types of latices — natural as well as synthetic. Accordingly, the following six test methods had been covered under IS : 9316§:

Part 1-1979	Determination of surface tension
Part 2-1979	Determination of viscosity

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*Methods of test for natural rubber latex: Part 1 Dry rubber content, sludge content, density, total alkalinity, KOH-number, mechanical stability, volatile fatty acid number, *p*H, total nitrogen, total copper, total iron, total manganese and total ash.

†Methods of test for natural rubber latex, Part 2.

‡Methods of test for styrene-butadiene rubber (SBR) latices: Part 1 Determination of dry polymer, *p*H, density, residual styrene, bound styrene and soap content.

§Methods of test for rubber latex.

Part 3-1979 Determination of coagulum content
Part 4-1979 Determination of total solids content
Part 5-1979 Drawing of samples
Part 6-1982 Determination of *p*H

0.2.2 As a result of further rethinking on the subject, it has now been decided to redesignate the test methods common to natural and synthetic rubber latices as RL series; test methods for natural rubber latex as NRL series and test methods for styrene-butadiene rubber latex as SBRL series. Consequently, test methods for rubber latex have been rationalized into the following three series:

a) IS : 9316 Unified methods of test applicable to both natural and synthetic rubber latices — RL series,

b) IS : 3708 Methods of test applicable to natural rubber latex — NRL series, and

c) IS : 4511 Methods of test applicable to sytrene-butadiene rubber latex — SBRL series.

0.3 The existing Indian Standards under IS : 3708 (Part 1)* and (Part 2)† and IS : 4511 (Part 1)‡ and IS : 9316 (Parts 1 to 6)§ are being gradually replaced by separate standards under the above three series designated by the appropriate NRL, SBRL, or RL series, respectively.

0.3.1 The methods covered under NRL : 13, NRL : 14 and NRL : 15 of IS : 3708 (Part 1)-1966* are now being covered under the RL series in IS : 9316§.

0.4 In order to facilitate cross-reference, it has been decided to retain the original discrete NRL, SBRL and RL series numbers assigned to various test methods, in IS : 3708 (Part 1)* and (Part 2)†, IS : 4511 (Part 1)‡ and IS : 9316 (Parts 1 to 6)§ in the revised parts of IS : 3708, IS : 4511 and IS : 9316§, respectively.

0.4.1 For proper referencing of the existing test methods and the new methods under revision, a statement showing corresponding methods is given in Appendix A.

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*Methods of test for natural rubber latex: Part 1 Dry rubber content, sludge content, density, total alkalinity, KOH-number, mechanical stability, volatile fatty acid number, *p*H, total nitrogen, total copper, total iron, total manganese and total ash.

†Methods of test for natural rubber latex, Part 2.

‡Methods of test for styrene-butadiene rubber (SBR) latices: Part 1 Determination of dry polymer, *p*H, density, residual styrene, bound styrene and soap content.

§Methods of test for rubber latex.

0.5 In preparing the above series, the need to align the test methods with the corresponding ISO Standards/DIS/DP, wherever available, has also been taken into account for updating the test methods. In the preparation of this standard, assistance has been derived from ISO 976-1986 'Rubber latices — Determination of *p*H', issued by the International Organization for Standardization (ISO).

0.6 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard (Part 6) prescribes a method for determination of *p*H of natural rubber latex containing preservative agents and which has been submitted to some type of concentration process, and also for determination of *p*H of synthetic rubber latex.

1.2 The accuracy of the method decreases at *p*H values above 11.

2. QUALITY OF REAGENTS

2.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977†) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

3. METHOD FOR TAKING OUT SAMPLES

3.1 The method for taking out samples shall be in accordance with the method prescribed in IS : 9316 (Part 5)-1988‡.

4. REAGENTS

4.1 Borax Solution, 0·01 M — Dissolve 3·814 g of sodium tetraborate decahydrate ($Na_2B_4O_7.10\,H_2O$) in water and dilute to 1 litre in a volumetric flask. The solution shall be stored in chemically resistant glass or polyethylene containers, fitted with soda-lime carbon dioxide traps. It shall be replaced after 1 month. The *p*H of this solution is 9·1 at 27°C.

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*Rules for rounding off numerical values (*revised*).

†Specification for water for general laboratory use (*second revision*).

‡Methods of test for rubber latex: Part 5 Drawing of samples (*first revision*).

5. APPARATUS

5.1 *p*H-Meter — Equipped with glass electrode and saturated calomel cell, and capable of being read to 0·02 unit. The glass electrode shall be of a type suitable for use in solutions of *p*H up to 13.

NOTE — Glassware with either cm^3 or ml marking is satisfactory for use with the procedure specified in this standard.

6. PROCEDURE

6.1 Standardization of *p*H-Meter — Calibrate the *p*H-meter according to the manufacturer's instructions within 2 *p*H units of the range of the latex to be tested, using commercially available solutions of known *p*H. If needed, use the borax solution. Standardization shall be carried out at an equilibrium temperature of 27 ± 1°C. Successive readings shall agree within 0·05 *p*H unit.

6.2 Determination of *p*H of Latex — Wash the electrodes with water and wipe dry with soft absorbent paper. Bring the latex to an equilibrium temperature of 27 ± 1°C, immerse the electrodes in the latex, and measure the *p*H value.

6.2.1 If a series of determinations is to be made, recalibrate the *p*H-meter in accordance with **6.1** at 30 min intervals, or more frequently, depending on the change found at each successive check.

6.2.2 Any film of rubber remaining on the glass electrode after washing it with water shall be removed with a rubber solvent, before storing or re-using the electrode.

6.2.3 When not in use, glass electrodes shall be kept in water and the calomel cell in a saturated potassium chloride solution.

6.2.4 The determination shall be carried out in duplicate and the result shall agree within 0·1 *p*H unit.

7. TEST REPORT

7.1 The test report shall include the following particulars:

a) Reference to this standard;

b) All details necessary for identification of the sample;

c) The *p*H value of the latex, expressed to the nearest 0·1 unit, and the test temperature;

d) Any unusual feature noted during the determination; and

e) Any operation not included in this standard to which reference is made, or regarded as optional.

APPENDIX A

(*Clause* 0.4.1)

TABLE SHOWING CORRESPONDENCE OF VARIOUS METHODS OF TEST COVERED IN THE EXISTING IS : 9316 (PARTS 1 TO 5)-1979, IS : 9316 (PART 6)-1982, IS : 3708 (PART 1)-1966, IS : 3708 (PART 2)-1968, IS : 4511 (PART 1)-1967 WITH THE REVISION/PROPOSED REVISION OF IS : 9316, IS : 3708 AND IS : 4511

Existing Test Methods			*Proposed Revision*	
Test Method	IS No.	Part (Series)	IS No.	Series
(1)	(2)	(3)	(4)	(5)
RL SERIES				
Determination of surface tension	IS : 9316-1979	Part 1	IS : 9316 (Part 1)-1987	(RL : 1)
Determination of viscosity	IS : 9316-1979	Part 2	IS : 9316 (Part 2)-1987	(RL : 2)
Determination of coagulum content	IS : 9316-1979	Part 3	IS : 9316 (Part 3)-1987	(RL : 3)
Determination of total solids content	IS : 9316-1979	Part 4	IS : 9316 (Part 4)-1988	(RL : 4)
Drawing of samples	IS : 9316-1979	Part 5	IS : 9316 (Part 5)-1988	(RL : 5)
Determination of *p*H	IS : 9316-1982	Part 6	IS : 9316 (Part 6)-1988	(RL : 6)
Determination of total copper	IS : 3708-1966	Part 1 (NRL : 13)	IS : 9316 (Part 7)-1987	(RL : 7)
Determination of total iron	IS : 3708-1966	Part 1 (NRL : 14)	IS : 9316 (Part 8)-1987	(RL : 8)
Determination of total manganese	IS : 3708-1966	Part 1 (NRL : 15)	IS : 9316 (Part 9)-1987	(RL : 9)

Existing Test Methods			*Proposed Revision*	
Test Method	IS No.	Part (Series)	IS No.	Series
(1)	(2)	(3)	(4)	(5)
NRL SERIES				
Determination of dry rubber content	IS : 3708-1966	Part 1 (NRL : 1)	IS : 3708 (Part 1)-1985	(NRL : 1)
Determination of sludge content	IS : 3708-1966	Part 1 (NRL : 5)	IS : 3708 (Part 2)-1985	(NRL : 5)
Determination of density	IS : 3708-1966	Part 1 (NRL : 6)	IS : 3708 (Part 3)-1985	(NRL : 6)
Determination of total alkalinity	IS : 3708-1966	Part 1 (NRL : 7)	IS : 3708 (Part 4)-1985	(NRL : 7)
Determination of KOH-number	IS : 3708-1966	Part 1 (NRL : 8)	IS : 3708 (Part 5)-1985	(NRL : 8)
Determination of mechanical stability	IS : 3708-1966	Part 1 (NRL : 9)	IS : 3708 (Part 6)-1985	(NRL : 9)
Determination of volatile fatty acid number	IS : 3708-1966	Part 1 (NRL : 10)	IS : 3708 (Part 7)-1986	(NRL : 10)
Determination of total nitrogen	IS : 3708-1966	Part 1 (NRL : 12)	IS : 3708 (Part 8)-1986	(NRL : 12)
Determination of total ash	IS : 3708-1966	Part 1 (NRL : 16)	IS : 3708 (Part 9)-1986	(NRL : 16)
Determination of boric acid	IS : 3708-1968	Part 2 (NRL : 17)	IS : 3708 (Part 10)-1986	(NRL : 17)
Determination of magnesium	IS : 3708-1968	Part 2 (NRL : 18)	IS : 3708 (Part 11)-1986	(NRL : 18)

SBRL SERIES

Determination of dry polymer	IS : 4511-1967	Part 1 (SBRL : 1)	IS : 4511 (Part 1)-1986	(SBRL : 1)
Determination of density	IS : 4511-1967	Part 1 (SBRL : 6)	IS : 4511 (Part 2)-1986	(SBRL : 6)
Determination of volatile unsaturates	IS : 4511-1967	Part 1 (SBRL : 8)	IS : 4511 (Part 3)-1987	(SBRL : 8)
Determination of bound styrene	IS : 4511-1967	Part 1 (SBRL : 9)	IS : 4511 (Part 4)-1986	(SBRL : 9)
Determination of soap content	IS : 4511-1967	Part 1 (SBRL : 10)	IS : 4511 (Part 5)-1986	(SBRL : 10)
Determination of high speed mechanical stability	—	—	IS : 4511 (Part 6)-1987	(SBRL : 11)

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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